

Herschel Medal - Professor Stephen J. Smartt

Full citation

Professor Stephen J. Smartt has made major contributions to our understanding of transient phenomena through his work in ground-breaking time-domain surveys. He is a leader in identifying and studying supernova progenitors, and he and his team were among the first to measure the masses and luminosities of the massive stars that die as core-collapse supernovae, thereby providing crucial tests of late-stage high-mass stellar evolution, of explosion models, and of stellar nucleosynthesis.

He and his group have discovered entirely new categories of eruptive objects, including extremely luminous ‘ultra-bright’ transients. He played a central role in the discovery and interpretation of the first electromagnetic counterpart to a gravitational-wave source, and led the 2017 *Nature* paper that showed that the merging neutron stars generated a kilonova outburst, powered by the radioactive decay of *r*-process nuclides. This work provided the definitive optical-domain evidence that neutron-star mergers produce gravitational waves and radioactively-powered kilonovae, and are a nucleosynthetic source of the *r*-process elements.

A pioneer of the new and burgeoning fields of high-cadence digital sky surveys and rapid data processing; a leader of both his own active research group and in international projects and consortia; and one of the most accomplished astronomers of his generation, Professor Smartt is an exceptionally worthy honouree “for investigations of outstanding merit in observational astrophysics”.

For these reasons, Professor Stephen Smartt is awarded the Herschel Medal.

Short citation

Professor Stephen Smartt is a pioneer in time-domain studies of transient phenomena, leading ground-breaking progress in our understanding of core-collapse supernova and of gravitational wave kilonovae.